

CLAIM AMENDMENTS

- 1 1. (Currently Amended) An apparatus for routing or switching data packets, including  
2 a router; and  
3 an expanded M-trie data structure, said data structure organized as a multi-level tree having  
4 a set of nodes, including a root node, inferior nodes and terminal nodes, wherein  
5 each node includes an address and an opcode.
- 1 2. (Previously Presented) An apparatus as in claim 1, wherein said data structure facilitates  
2 a lookup based on data included in a data packet.
- 1 3. (Previously Presented) An apparatus as in claim 1, wherein said data structure facilitates  
2 a lookup of data included in a packet header.
- 1 4. (Previously Presented) An apparatus as in claim 1, wherein said data structure facilitates  
2 a lookup of data included in an Internet Protocol packet header.
- 1 5. (Previously Presented) An apparatus as in claim 1, wherein said opcode describes an  
2 operation to be performed based upon data included in a packet header so as to facilitate  
3 lookup of said packet header.
- 1 6. (Previously Presented) An apparatus as in claim 1, wherein said address includes the  
2 address of a node in said expanded M-trie data structure that is to be traversed.

1 7. (Original) An apparatus as in claim 1, wherein said expanded M-trie data structure  
2 includes a set of access control parameters.

1 8. (Previously Presented) An apparatus as in claim 1, wherein said expanded M-trie data  
2 structure includes a set of Quality of Service (QoS) parameters.

1 9. (Previously Presented) An apparatus as in claim 1, wherein said expanded M-trie data  
2 structure includes a set of Class of Service (CoS) parameters.

1 10. (Previously Presented) An apparatus as in claim 1, wherein said nodes include opcodes  
2 for demultiplexing, opcodes for matching, and opcodes for hashing.

1 11. (Previously Presented) An apparatus as in claim 10, wherein said opcodes for  
2 demultiplexing include instructions to demultiplex into branches of said expanded M-trie  
3 data structure based on contents of one or more bytes included in a data packet.

1 12. (Previously Presented) An apparatus as in claim 10, wherein said opcodes for  
2 demultiplexing include instructions to demultiplex into branches of said expanded M-trie  
3 data structure based on contents of one or more bytes included in a packet header that is  
4 being read.

1 13. (Previously Presented) An apparatus as in claim 10, wherein said opcodes for  
2 demultiplexing include instructions to demultiplex into branches of said expanded M-trie

3 data structure based on contents of one or more bytes included in an Internet Protocol packet  
4 header that is being read.

1 14. (Previously Presented) An apparatus as in claim 10, wherein said opcodes for matching  
2 include instructions to compare contents of a byte in the flow label to given node data.

1 15. (Previously Presented) An apparatus as in claim 10, wherein said opcodes for hashing  
2 include instructions to hash into different branches of the expanded M-trie data structure  
3 based on contents of a byte in said packet header.

1 16. (Currently Amended) A method for routing or switching data packets, including the  
2 steps of:  
3 receiving a data packet at an input interface on a router or switch;  
4 looking up information in the header of said data packet in an expanded M-trie data  
5 structure, wherein said expanded M-trie data structure is organized as a multi-level  
6 tree including a root node, inferior nodes, and terminal nodes, wherein each node  
7 includes an address and an opcode;  
8 terminating said lookup; and  
9 routing said data packet at one or more output interfaces on said router or said switch.

1 17. (Canceled)

1 18. (Currently Amended) A method as in claim ~~17~~16, wherein said opcode describes an  
2 operation to be performed that is based upon data included in a packet header, so as to  
3 facilitate a lookup of said packet header.

1 19. (Currently Amended) A method as in claim ~~17~~16, wherein said address includes the  
2 address of a node in said expanded M-trie data structure that is to be traversed.

1 20. (Original) A method as in claim 16, wherein said expanded M-trie data structure  
2 includes a set of access control parameters.

1 21. (Previously Presented) A method as in claim 16, wherein said expanded M-trie data  
2 structure includes a set of Quality of Service (QoS) parameters.

1 22. (Previously Presented) A method as in claim 16, wherein said expanded M-trie data  
2 structure includes a set of Class of Service (CoS) parameters.

1 23. (Currently Amended) A method as in claim ~~17~~16, wherein said nodes include opcodes  
2 for demultiplexing, opcodes for matching, and opcodes for hashing.

1 24. (Previously Presented) A method as in claim 23, wherein said opcodes for  
2 demultiplexing include instructions to demultiplex into branches of said expanded M-trie  
3 data structure based on contents of a byte of said packet header that is being read.

1 25. (Previously Presented) A method as in claim 23, wherein said opcodes for matching  
2 include instructions to compare the contents of a given byte of the flow label to given node  
3 data.

1 26. (Currently Amended) A method as in claim 23, wherein said opcodes for hashing  
2 include instructions to hash into different M-trie plus branches based on the contents of a  
3 given [[4]] byte in said packet header.

1 27. (Canceled)

1 28. (Currently Amended) An apparatus for routing or switching data packets, comprising a  
2 device that performs a method comprising:  
3 storing in memory an M-trie data structure, said data structure organized as a multi-level tree  
4 having a set of nodes, including a root node, inferior nodes and terminal nodes,  
5 wherein each node includes an address and an opcode;  
6 receiving a data packet at an input interface on a router or switch, wherein the data packet  
7 includes information in ~~an M-trie data structure~~ having at least a header with at least  
8 ~~an entity~~ a field that is used by said M-trie data structure to indicate[[s]] an action for  
9 ~~the router~~ said device to perform in order to select a leaf associated with said M-trie  
10 data structure;  
11 looking up the information, wherein the looking up includes performing the action; and  
12 routing said data packet at one or more output interfaces on said router or said switch.

1 29. (Currently Amended) A method for routing or switching data packets, comprising:

2 storing in memory an M-trie data structure, said data structure organized as a multi-level tree  
3 having a set of nodes, including a root node, inferior nodes and terminal nodes,  
4 wherein each node includes an address and an opcode;  
5 receiving a data packet at an input interface on a router or switch, wherein the data packet  
6 includes information in ~~an M-trie data structure having~~ at least a header with at least  
7 ~~an entity~~ a field that is used by said M-trie data structure to indicate[[s]] an action for  
8 ~~the~~ a router to perform in order to select a leaf associated with said M-trie data  
9 structure;  
10 looking up the information, wherein the looking up includes performing the action; and  
11 routing said data packet at one or more output interfaces on said router or said switch.

1 30. (Currently Amended) A memory storing a program for performing a method for routing  
2 or switching data packets, comprising:  
3 storing in memory an M-trie data structure, said data structure organized as a multi-level tree  
4 having a set of nodes, including a root node, inferior nodes and terminal nodes,  
5 wherein each node includes an address and an opcode;  
6 receiving a data packet at an input interface on a router or switch, wherein the data packet  
7 includes information in ~~an M-trie data structure having~~ at least a header with at least  
8 ~~an entity~~ a field that is used by said M-trie data structure to indicate[[s]] an action for  
9 ~~the~~ a router to perform in order to select a leaf associated with said M-trie data  
10 structure;  
11 looking up the information, wherein the looking up includes performing the action; and  
12 routing said data packet at one or more output interfaces on said router or said switch.

1 31. (Canceled)

1 32. (Currently Amended) A memory as in claim ~~31~~30, wherein said address includes an  
2 address of a node in said M-trie data structure that is to be traversed.

1 33. (Previously Presented) A memory as in claim 30, wherein said M-trie data structure  
2 includes a set of access control parameters.

1 34. (Previously Presented) A memory as in claim 30, wherein said M-trie data structure  
2 includes a set of Quality of Service (QoS) parameters.

1 35. (Previously Presented) A memory as in claim 30, wherein said expanded M-trie data  
2 structure includes a set of Class of Service (CoS) parameters.

1 36. (Currently Amended) A memory as in claim ~~31~~30 wherein at least one of the root node,  
2 inferior nodes, or the terminal node includes an opcode for demultiplexing, an opcode for  
3 matching, and an opcode for hashing.

1 37. (Previously Presented) A memory as in claim 36 wherein said opcode for  
2 demultiplexing includes instructions to demultiplex into branches of the M-trie data  
3 structure based on contents of a byte of said packet header.

1 38. (Previously Presented) A method as in claim 36, wherein said opcode for matching  
2 includes instructions to compare the contents of a given byte of a flow label to given node  
3 data.

- 1 39. (Previously Presented) A method as in claim 36, wherein said opcode for hashing
- 2 includes instructions to hash into different branches the M-trie data structure based on the
- 3 contents of a given set of bytes in said packet header.